

CXI CONNECTWARE™

3278/79 STANDARD remote connection

User Reference Guide

Notes:

CXI, Inc.
3606 West Bayshore Road
Palo Alto, CA 94303-4229
U.S.A

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This Edition applies to CXI 3278/79 STANDARD remote connection with Release 1.0 of the Control Program.

With Control Program Release 1.0, 3278/79 STANDARD remote connection consists of the following components:

- o CXI BDLC (Basic Data Link Control) Communications Board
- o CXI 3278/79 STANDARD remote connection Control Program Release 1.0 without host printer support (CXI3278A Release 1.0)
- o CXI 3278/79 STANDARD remote connection Control Program Release 1.0 with host printer support (CXI3278B Release 1.0)
- o CXI 3270 Series Customization Program (CXICFIG Release 1.2)

The following are also supplied

- o CXI Keyboard Map Utility (KBMAP), Release 1.5
- o Several Keyboard/Display Files
- o This User Reference Guide
- o CXI 3278/79 STANDARD Keyboard Template
- o CXI 3270 Series Technical Reference Manual

The following is available, at extra cost, from your CXI Distributor or Dealer

- o CXI 3270 Series File Transfer Facility, which includes:
 - CXI 3270 Series File Transfer Program
 - CXI 3270 Series File Transfer Batch File Generator
 - File Transfer Facility User Reference Guide
 - File Transfer Facility Host Software Installation Guide

Changes are periodically made to the information herein. These changes will be incorporated in new editions of this publication.

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Palo Alto, CA 94303-4229
U.S.A

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Preface

This User Reference Guide explains how to use CXI 3278/79 STANDARD remote connection. It provides you with the following information:

System Requirements

Installing the Hardware

Customizing the Control Program

Using the Control Program

System Requirements

CXI 3278/79 STANDARD remote connection operates under DOS 2.0 or later and requires an IBM PC, PC-XT, PC-AT or compatible system. The PC requires at least 320 kbytes of memory. More memory may be required with DOS 3.0 or 3.1, especially if a large number of disk buffers is specified.

Monochrome and color adapters are supported. Color adapters may be used for standard color, composite color or composite monochrome monitors.

CXI distribution diskettes are recorded double-sided, in DOS 2 format.

The CXI 3270 Series File Transfer Facility

This is not included with CXI 3278/79 STANDARD remote connection. It is available, at extra cost, from your CXI Distributor or Dealer.

The File Transfer Program increases total PC memory requirements by 96 kbytes.

Writing Application Programs to Interface with the Control Program

This and related topics are covered in the CXI 3270 Series Technical Reference Manual.

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SECTION I

INTRODUCTION

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Chapter 1

Description of the CXI 3278/79 STANDARD remote connection and Control Program

The CXI 3278/79 STANDARD remote connection consists of an add-in board for an IBM or IBM-compatible personal computer, and associated software, including a Control Program, a customization program and a number of utility programs.

Control Program

The Control Program, which is the operational software, allows you to operate your personal computer as an IBM 3278 or 3279 Display Terminal.

You may operate your PC as a 3278 Model 2, 3, 4 or 5, or 3279 Model 2A or 3A Display Terminal, and you may also use a PC-attached printer as a host-addressable 3287 Printer.

When you customize your Control Program, you may specify the use of any of a number of national keyboards (French AZERTY, Austrian/German, Danish, Norwegian, Belgian, etc.).

A Screen-Control Application Program Interface (described in the CXI 3270 Series Technical Reference Manual) supports user-written applications and the CXI 3270 Series File Transfer Facility.

Organization of this Reference Guide

Section II provides information on operating 3278/79 STANDARD remote connection.

Section III deals with problem solving.

Appendix A provides technical specifications for the board.

Appendix B tells you how to install the board in your PC.

Appendix C tells you how to customize the Control Program.

Appendix D is a glossary of terms.

Remote Connection and Control Program

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Activating the Control Program

Installation

Because you must specify a PUID (Physical Unit Identification) for a dial-up connection, or an SDLC Control Unit Address for a leased-line connection, you will not be able to use the remote connection Control Program as delivered. You should first install the board as described in Appendix B, then turn to Appendix C--Customizing the Control Program.)

Multiple Control Program Versions

There is no practical limit to the number of customized versions of the Control Program. You may wish to have one which operates as a 3278 Model 2, another which operates as a 3278 Model 3, and so on.

Loading and Executing the Control Program

To load the **customized** Control Program, enter:

<name>

where **<name>** is **CXI3278A**, for the Control Program without host printer support, or **CXI3278B** for the Control Program with host printer support. (You may rename the Control Program as you please.) When the Control Program is loaded, it is made *resident*, as an extension of DOS. It will remain *resident* until the PC is rebooted.

Using Your Autoexec File to Load the Control Program

You may wish to make the Control Program a permanent extension of DOS. You may do this by placing the command which loads it (e.g. **px r**) in your autoexec file. This way, it will be loaded and made *resident* every time you power on or reboot your system. The use of batch files is described in your DOS manual.

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Chapter 3

The Keyboard

Introduction

With some minor compromises, the standard IBM PC keyboard provides all the functions needed for operation with CXI 3278/79 STANDARD remote connection.

When you use CXI 3278/79 STANDARD remote connection as a 3278 or 3279 terminal, you are said to be operating in *Terminal Mode*.

Terminal Mode and normal *PC mode* have their own special relationship to the keyboard. The keystrokes used for *Terminal Mode* operation are those defined in the standard CXI keyboard/display files, included with CXI 3278/79 STANDARD remote connection software. The CXI Keyboard Map Utility, described in the CXI 3270 Series Technical Reference Manual, may be used to change any of these keystrokes.

For PC Sessions, the keyboard is used exactly as described in your IBM PC Guide to Operations and the DOS User's Guide (or equivalent, for IBM PC compatibles).

CXI 3278/79 STANDARD remote connection will trap one keystroke combination, [Alt][Scroll Lock] for mode switching purposes. It is used to go from *PC mode* to *Terminal Mode*, and vice versa.

Alphanumeric Keys

With three exceptions, all standard IBM 3270 characters appear in the alphanumeric portion of the PC keyboard. The exceptions are the logical NOT symbol, the cent sign and the logical OR symbol (vertical bar). Fortunately, the PC's displayable character set includes all three.

The *standard* CXI compromise for these three symbols is:

| 3270 Symbol | PC Key |
|----------------|-----------|
| ↵ | ^ |
| ⌘ | [|
| |] |

Figure 3-1
Symbol Substitutions

On the CXI 3278/79 STANDARD Template, the 3270 symbols are shown in blue.

The CXI Keyboard Map Utility, described in the CXI 3270 Series Technical Reference Manual, may be used to specify alternative substitutions.

Function Keys

CXI 3278/79 STANDARD remote connection uses function keys for actions involving host software. (Program Function (PF), Program Access (PA), Clear, Attn, Sys Req, Enter, etc.) and for invoking *Printer Control Mode*.

[**â**] ([Ins]) and [**ā**] ([Del]), and the cursor positioning keys, including [**Home**], operate as they do on a 3278 or 3279 (except that fast cursor left and fast cursor right use [Ctrl], rather than [Alt]). As on a 3278/79, the backspace key is synonymous with the left cursor key. Tab and backtab operations are governed by screen format (protected and unprotected fields), and the [Enter] key ([↵] on the PC) operates in the same manner as the 3278/79 [Enter] key. With *standard* CXI keyboard/display files, the large [+] key operates as the 3278/79 [↵] (new line) key.

[PF1] to [PF12] use the same keystrokes as the standard U.S. 87-key EBCDIC typewriter keyboard on a 3278 or 3279 ([Alt], in conjunction with the top row of keys). Because the PC has no 12-key pad for [PF13] to [PF24], you must use [Shift][Alt], in conjunction with the top row of keys. This is shown in Figure 3-2.

| | | | | | |
|------|------|------|------|-----|------|
| 1 | 2 | 3 | 4 | | = |
| PF13 | PF14 | PF15 | PF16 | ... | PF24 |
| PF1 | PF2 | PF3 | PF4 | | PF12 |

Figure 3-2
Program Function Keys

The 10 keys on the left of the keyboard are used in the same manner as the corresponding keys of a standard IBM 3278 or 3279, as shown in Figure 3-3. The one additional key is [PrCtrl] ([Shift][F3]), used to invoke the 3278/79 STANDARD remote connection's *Printer Control Mode* (see Chapter 5).

| | |
|--|--|
| F1----- Attn ----- Sys Req | F2----- Cursor Sel ----- Clear |
| F3----- PrCtrl ----- | F4----- ----- Erase Input |
| F5----- ----- Alt Cursor | F6----- Erase EOF ----- |
| F7----- ----- | F8----- ----- Test |
| F9----- Dup ----- PA1 | F10----- Field Mark ----- PA2 |

Figure 3-3
Terminal Mode Usage of PC Function Keys

The Keyboard

You should note that there are some keystroke combinations which are used for local functions related to the host terminal session.

[Shift][PrtSc/*] will print the contents of the entire logical 3278/79 screen (Model 2, 3, 4 or 5) on the printer attached as LPT1.

[PrtPS+OIA] ([Alt][PrtSc/*]) will print the logical 3278/79 screen. (This legend does not appear on all 3278/79 STANDARD Templates.)

[PrtSc+OIA] ([Ctrl][PrtSc/*]) will print the logical 3278/79 screen and the Operator Information Area.

[Ctrl][F] will cause a form feed to occur on the same printer.

CXI's *standard Terminal Mode* keystrokes conform as closely as possible to IBM practice, and are incorporated in the keyboard/display files distributed with CXI 3278/79 STANDARD remote connection, and installed at customization time. They are also shown on the keyboard template. The CXI Keyboard Map Utility, described in the CXI 3270 Series Technical Reference Manual, may be used to reassign any or all keys.

Standard CXI Mapping

The functions named in the following table are described later in this chapter.

| Name | Key or Key Combination |
|-----------------|------------------------------------|
| [Alt Cursor] | [Alt][F5] |
| [Attn] | [F1] |
| [←] (Backspace) | [←] |
| [←] (Backtab) | [Shift][←->] |
| [Clear] | [Alt][F2] |
| [Cursor Sel] | [F2] |
| [a] (Delete) | [Del] |
| [Dup] | [Alt][D] |
| [Enter] | [↵] (Enter/Return) |
| [Erase EOF] | [F6] |
| [Erase Inp] | [Alt][F6] |
| [Field Mark] | [F10] |
| [Form Feed] | [Ctrl][F] |
| [Home] | [Home] |
| [â] (Insert) | [Ins] |
| [↵] (New Line) | [+] (large ";" key) |
| [PA1] | [Alt][F9] |
| [PA2] | [Alt][F10] |
| [PF1]-[PF10] | [Alt][1]-[Alt][0] |
| [PF11] | [Alt][-] 1 |
| [PF12] | [Alt][=] 1 |
| [PF13]-[PF22] | [Shift][Alt][1] to [Shift][Alt][0] |
| [PF23] | [Shift][Alt][-] 1 |
| [PF24] | [Shift][Alt][=] 1 |
| [PrCtrl] | [Shift][F3] 2 |
| [PrtSc+OIA] | [Ctrl][PrtSc] |
| [PrtSc] | [Shift][PrtSc/*] |
| [Reset] | [End] |
| [SysReq] | [Alt][F1] |
| [→] (Tab) | [←->] |
| [Test] | [Alt][F8] |

Table 3-1
Standard CXI Key Mapping

1. [-] and [=] assume U.S. English PC keyboard. If you have a non-U.S. keyboard, please read [-] and [=] as the first and second keys to the right of [0] (zero key), respectively.
2. See Chapter 5.

Key Function Definitions

The function of each of the keys named in Table 3-1 is briefly described below. Detailed descriptions are provided in the referenced chapters.

[Alt Cursor]

Selects a blinking underline or steady block cursor.

[Attn]

Requests the attention of an operating host program.

[←] (Backspace)

Moves the cursor left one position. If in column 1, moves to the last column of the previous line. If in line 1, column 1, moves to last position of presentation space.

[|←] (Backtab)

Moves the cursor to the beginning of the previous unprotected field or, if in an unprotected field in other than the first position, to the beginning of the current field. Wraps the end of the presentation space, if necessary.

[Clear]

Clears the host screen to nulls, places the cursor at line 1, column 1 and, solicits host program action.

[Cursor Sel]

Allows 3278/79 Selector Light Pen function to be performed from the keyboard (see IBM documentation).

[] (Delete)

Deletes the character at the cursor position and moves left those characters which are to the right of the cursor position and in the same unprotected field. Places a null in the rightmost position of the field.

[Dup]

Causes a unique character (displayed as an asterisk [*] with *standard* CXI mapping) to be entered at the cursor position, and executes a tab operation to the next unprotected field.

[Enter]

Solicits host program action, usually involving the reading, by the host program, of all modified fields.

[Erase EOF]

If the cursor is in an unprotected field, replaces characters from the cursor position to the end of the field with nulls.

[Erase Inp]

Replaces the contents of all unprotected fields with nulls.

[Field Mark]

Causes a unique character (displayed as a semicolon [;] with *standard* CXI mapping) to be entered at the cursor position

[Form Feed]

Advances the paper, in the printer attached to the PC as LPT1, to the top of the next page.

[Home]

Moves the cursor to the first position of the first unprotected field. If there are no unprotected fields, moves the cursor to line 1, column 1.

[â] (Insert)

Turns on Insert Mode. Subsequent alphanumeric key-strokes will, for unprotected fields, cause characters to the right of the character being entered to move right to progressively occupy positions, within the same field, which contain nulls. The absence of nulls in the entry field will cause input to be inhibited.

[↵] (New Line)

Moves the cursor to the first unprotected field of the first line, following the current line, that has any unprotected fields. Wraps at the end of the presentation space. In document mode, with *Entry Assist*, moves the cursor to the left margin of the following line (if the left margin position is unprotected).

[PA1] and [PA2]

Used to solicit host program action without the transmission of modified data. See documentation for relevant host software (e.g. TSO, CMS).

[PF1]-[PF24]

Used to solicit host program action with the transmission of modified data. See documentation for relevant host software (e.g. TSO, CMS).

[PrCtrl]

Places the Control Program in *Printer Control Mode*, allowing the setup of a PC-attached printer as if it were an IBM 3287 and the initiation of a host-controlled printer session (Chapter 5).

[PrtSc]

Prints the entire logical host screen on the PC-attached printer addressed as LPT1.

[PrtSc+OIA]

Prints the contents of the entire logical host screen, including the Operator Information Area, on the PC-attached printer addressed as LPT1.

[Reset]

Used to recover from any of several possible controller-initiated keyboard-inhibited conditions.

[SysReq]

Initiates session switch procedures. Usually used prior to logging on to the host. (See IBM documentation.)

[→] (Tab)

Moves the cursor to the beginning of the next unprotected field. Wraps the end of the presentation space, if necessary.

CXI 3278/79 STANDARD Keyboard Template

CXI 3278/79 STANDARD is shipped with a plastic keyboard template like the one shown in Figure 3-4 (on the next page). It shows the PC keys and key combinations which correspond to the functions described in this chapter.

Symbols for PC functions and those functions common to PC and 3278/79 operation are in black. Symbols unique to 3278/79 operation and to CXI 3278/79 Control Program actions are in blue.

Place the template on the ledge above the top row of keys on your PC keyboard. It will serve as a reference guide.

Note that CXI provides the same Template with 3278/79 STANDARD coaxial connection and 3278/79 STANDARD remote connection. Hence, keytop and keyfront legends are included for 3274 Controller-related functions (e.g. Ident, Print, Doc On/Off, Dev Cancel, etc.). These and the Screen Save, Scroll Up/Scroll Down and First 24/Last 24 functions do not apply to the remote connection.

[PrCtrl], not shown on the template, uses [Shift][F3] with *standard* CXI mapping.

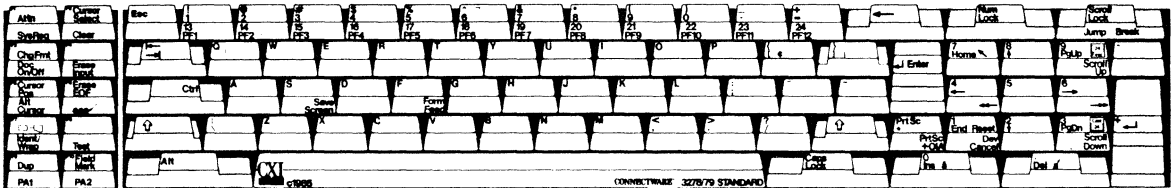


Figure 3-4
CXI 3278/79 STANDARD Template

Chapter 4

The Display

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Introduction

In Terminal Mode, the 25th line of the PC display serves the same function as the Operator Information Area of a 3278 or 3279.

Operator Information Area (Status Line)

The Operator Information Area shows the status of the session, the keyboard and the communication link.

In the following pages, we list the IBM 3270 Operator Information Area symbols, their CXI equivalents, and their names where appropriate. IBM manuals provide a more complete explanation of these symbols.

Positions 1 to 7 of the Operator Information Area are reserved for the Readiness and System Connection Symbols.

Table 4-1 lists the 3270 indicator symbols used in positions 1 to 7, and the CXI equivalent symbols.











| 3270 Characters | CXI Characters | Name |
|---|---|-----------------|
|  |  | Ready |
|  | A | Online A * |
|  | B | Online B * |
|  |  | My Job |
|  |  | System Operator |
|  |  | Unowned |

Table 4-1
Positions 1 to 7--Readiness and
System Connection Symbols

Table 4-2 lists the symbols used in the remainder of the Operator Information Area.





























| IBM 3270 Character | CXI Character | IBM 3270 Character | CXI Character |
|---|---|---|---|
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Table 4-2
Individual Symbols Used in Composite Messages

The composite symbols used in the Operator Information Area are combinations of the symbols in the previous table. The system displays these composite symbols in the middle portion of the Operator Information Area to explain input inhibited status, communication link status. Positions 9 to 17 are reserved for Input Inhibited Symbols and positions 21 to 26 are reserved for Communication Link Status. Positions 60 to 64 are reserved for controller-attached Printer Status, which is not applicable to the 3278/79 STANDARD remote connection.

Tables 4-3 and 4-4 show the 3270 composite symbols and their CXI equivalents. For a discussion of the meanings of these composite symbols and proper actions for the conditions they indicate, consult IBM Component Description Manuals for the IBM 3274/6 Controllers (IBM GA23-0061 or GA18-2081).

| IBM 3270 Indicator | CXI Indicator | Name |
|-----------------------|------------------|-----------------------------|
| X SYSTEM | X SYSTEM | System Lock |
| X PROG nnn | X PROG nnn | Program Check |
| X ① | X () | Time |
| X ② nnn | X = nnn | Machine Check |
| X ③ nnn | X +-z__ nnn | Communication Check |
| X ?+ | X ?+ | What? |
| X -f | X -f | Minus Function |
| X -f⊗X | X -f⊗X | Minus Function Op Unauth |
| X o- _n | X o- | Security Key |
| X ④ ⑤ | X == | Printer Not Working |
| X ④ ⑤ ① | X == () | Printer Busy |
| X ④ ⑤ ① ① | X == () () | Printer Very Busy |
| X ⊗X | X ⊗X | Operator Unauth. |
| X ⊗→ | X ⊗→ | Go Elsewhere |
| X ⊗> | X ⊗> | More Than |
| X ⊗#? | X ⊗#? | What Number |
| X -S | X -S | Minus Symbol |

Table 4-3
Positions 9 to 17--Input Inhibited

Note that the composite symbols for controller-attached printer status do not apply to the 3278/79 STANDARD remote connection. They are included for completeness.

| IBM 3270 Indicator | CXI Indicator | Name |
|-----------------------|------------------|---------------------------|
| Σ nnn | + - z _ nnn | Communication Reminder |

Table 4-4
Positions 21 to 26--Communication Link Status

Working with the Display

If you have worked with IBM 3270 terminals before, you are familiar with the protected and unprotected screen areas. You will find that your PC operates like the 3278/79. For example, if you try to enter a character into a protected field, the system "locks" the keyboard (i.e. it inhibits keyboard input) and you will not be able to resume the entry of information until you press [Reset].

You will also find that, if you try to enter a character at a screen attribute byte position, the keyboard will lock up until you reset it. Use the cursor arrow keys and [Home] to move the cursor around the screen. You will notice that you cannot move the cursor into the Operator Information Area (line 25). The cursor will, instead, move to the top of the screen.

Use [Home] to move the cursor to the first unprotected field on the screen. Use the Tab key to move the cursor to the next unprotected field. When you attempt to enter data beyond the end of an unprotected field, the system will inhibit the keyboard until you reset it.

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Printing

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In *terminal mode*, either the physical PC screen or the terminal session presentation space (3278/79 screen) may be printed on a PC-attached printer. In *PC mode*, the physical PC screen may be printed.

Physical Screen

In *PC mode* or *terminal mode*, the effect of [Shift]-[PrtSc/*] is the same as it is for normal PC operation. That is, the information displayed on the PC monitor is directed to the printer attached to LPT1. In *PC mode*, LPT1 may be redirected to another port (e.g. COM1) with an attached printer.

Logical Screen

CXI 3278/79 STANDARD remote connection allows the emulation of screen sizes larger than 80 columns by 25 lines.

3278/79 Models 3, 4 and 5 are handled by means of implicit scrolling, based on the position of the cursor. Thus, not all of the emulated display appears on the physical screen at one time.

To print the entire logical 3278/79 screen, when in *terminal mode*, press

[Alt][PrtSc/*]

Logical Screen plus Operator Information Area

Sometimes you may need to capture the contents of the Operator Information Area (status line).

To print the entire logical 3278/79 screen plus the Operator Information Area, when in terminal mode, press

[Ctrl][PrtSc/*]

Host-Controlled Printing

To activate a host-controlled printer session, you need to enter Printer Control Mode. To do this (from terminal mode only), press:

[PrCtrl]

(With *standard* CXI mapping, this is [Shift][F3] on the PC keyboard.)

A screen like the one shown in Figure 5-1 will appear.

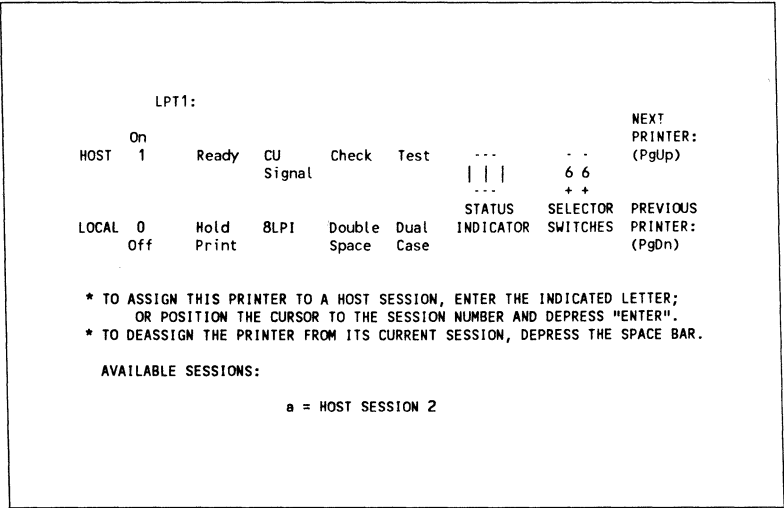


Figure 5-1
Printer Session Screen--Local Mode

The center of the screen is an image of the left half of the front panel of a 3287 Printer (the one IBM refers to as 3287 Printer, Stage 2), plus the selector switches from the right end of the panel. A light character (x), above the corresponding legend, is used to signify that an indicator light is on. Where the corresponding indicator light on the 3287 would blink, the light character also blinks.

The host session is the single printer session included in **CXI3278B**. The logical printer designation, at the top of the screen, is the first of the five that were shown on the printer customization panel (see **Appendix C**). You may select any of the five possible printer designations (LPT1, LPT2, LPT3, COM1 or COM2), as long as your PC is correspondingly equipped.

Setup Procedure

The setup procedure allows you to directly access emulated 3287 switches, using alphanumeric designations, or to use the cursor-positioning keys, followed by **[Enter]** to logically depress switches.

The four cursor-positioning keys will move the cursor to the closest switch in the direction indicated, following normal line-wrap and screen-wrap conventions.

To perform the setup procedure,

1. Make sure that the real printer you will be using is correctly set up (switched on, correct form loaded, positioned at the top of the page, etc.).
2. Select the logical printer, using **[PgUp]** and/or **[PgDn]**.
3. If you wish to change the number of lines per page (the default is 66), use the **[+]** and **[-]** keys on the right side of the PC keyboard to change the switch values. If you wish to change only the tens digit or only the units digit, move the cursor to that position first, then press **[Enter]** as many times as required.
4. Activate the host session as indicated on the screen (by entering the letter "a" or by moving the cursor to the (only) available session and pressing **[Enter]**). (This is necessary even though only one LU Type 1 host session is available.)

The host session number will appear at the top of the screen. If the host system is attempting to use the session, the message **PLUNAME = xxxxxxxx** will appear, where xxxxxxxx is the printer logical unit name. Otherwise the message will be **PLUNAME = unbound**.

5. Press [1] to logically turn the printer on. (You must turn the physical printer on in the usual way.) The switch portion of the 3287 front panel will now appear on the screen, which will look like the one shown in Figure 5-2. The printer is now set up for host operation.

(If the printer session is bound (i.e. if there is a PLUNAME), printing will start as soon as the host system receives the logical unit status (saying the printer is available). If you wish to delay printing while you change switch settings, press [2] (Hold Print) immediately.)

| LPT1: | | | | | | | | | |
|-----------|----------------|--------------|----------------|---------------|------------------|---------------------|----------------------|--------------------------------|--|
| HOST | On 1 | Ready | CU Signal | Check | Test | --- | --- | NEXT PRINTER: (PgUp) | |
| | | | | | | | 6 6 | | |
| | | | | | | --- | ++ | | |
| LOCAL | 0 Off | Hold Print | 8LPI | Double Space | Dual Case | STATUS INDICATOR | SELECTOR SWITCHES | PREVIOUS PRINTER: (PgDn) | |
| Alternate | Reset Alter | Set Funct | Set Param | Hundreds | Tens | Units | | | |
| Primary | Hold Print 2 | Change LPI a | Change Space b | Change Case c | Form Feed d | Setup e | Reset f | Test | |
| | 3 Enable Print | 4 Set Alter | 5 PA1 | 6 PA2 | 7 Buffer Reprint | 8 Index | 9 Cancel Print | | |

Figure 5-2
Printer Session Screen--Host Mode

6. Each control button represented on the screen has a letter or a number associated with it. To "depress" a control button, press the corresponding key (e.g. [b] for Change Space) or move the cursor to its representation on the screen and press [Enter].

Where holding a button down (rather than pressing it momentarily) is appropriate for a real 3287, holding down the corresponding key will produce the same effect. For example, holding down [8] (or [Enter] where the cursor is positioned at the **Index** location on the screen) will cause continuous line feeds. One exception is the Setup button.

If you want to print the letter H continuously, move the cursor to Setup (letter e), then hold down [Ctrl] as long as you want to continue printing H. This allows differentiation between repeated H's in column 1 and a string of H's.

Use the control functions as you would on a real 3287 (as described in IBM publication GA27-3150, IBM 3287 Printer Models 1 and 2 Operator's Guide).

7. When you are ready to allow printing to start, press [3] (Enable Print).
8. Return to Terminal Mode, by pressing [PrCtrl] ([Shift][F3]).

If you subsequently select *printer control mode*, the screen exemplified in Figure 5-2 will reappear. You may switch the printer off, or read the status indicator, or perform any of the functions associated with a real 3287.

CXI's printer support accepts SNA Character Strings (SCS). Therefore, most setup functions (lines per inch, characters per line, etc.) will usually be unnecessary.

Avoiding Conflicts Between Local and Host Printing

The CXI 3278/79 STANDARD remote connection does not support between-brackets printer sharing (with its associated Printer Busy and Printer Very Busy messages) for PC-attached printers. Therefore, if you have established a host printer session on LPT1, you will need to exercise caution when printing screens or 3278/79 presentation spaces (unless you are sure that the host system has no output queued for your printer's PLU-NAME).

Printing

You can prevent conflicts, by entering *printer control mode* ([PrCtrl]) and pressing either [0] (to switch the printer to local mode), or [2] (to set Hold Print), then leaving *printer control mode* (by pressing [PrCtrl] again). After you have performed the screen or presentation space printing, you can restore the printer by re-entering *printer control mode* and pressing [1] (if you previously pressed [0]), or [3] (if you previously pressed [2]).

The use of [Shift][PrtSc/*] and [Ctrl][PrtSc/*], when operating in *PC mode*, follows normal DOS practice. If you are using CXI's printer support, you should use the standard DOS support with caution. For example, if LPT1 is being used for host-directed printing and you have not reassigned LPT1 to, say, COM1, the DOS Print-Screen function will attempt to use the same printer, with unpredictable results. Also, if LPT1 has no printer connected and you have not performed any reassignment, the DOS Print Screen function will loop for about 1 minute and may inhibit the Control Program's ability to respond to host activity.

If you have two printers, a safe strategy is to use the one attached to LPT1 for local printing (both CXI 3278/79 STANDARD remote connection and DOS) and use the one attached to one of the other ports for host-directed printing.

Warning

For local printing on LPT1 or host-directed printing on LPT1, LPT2 or LPT3, the CXI 3278/79 STANDARD remote connection depends on the parallel interface board's ability to present interrupts. (This is what allows it to print in the background.)

Early documentation concerning IBM's parallel printer interface contained an error. Other board manufacturers based their design on the erroneous documentation in IBM's Technical Reference Manual. If you have an older non-IBM board with a parallel interface, you should check with the manufacturer, who can either assure you that the design is correct or may be able to tell you how to correct it (a process which usually involves a soldering iron, a sharp knife, and a short piece of wire).

IBM's more recent documentation is correct.

Chapter 6

Saving the Screen to Disk

You will need the services of the **File Transfer Program**, (available, at extra cost, from your CXI Distributor or Dealer) to save 3278/79 screens.

To set up the File Transfer Program for this purpose, jump from *terminal mode* to *PC mode* (using [Alt][Scroll Lock]) and enter the command **FTP**.

If you do not wish to use the default name, SCREEN.SAV, select Option 4 from the Primary Option Menu to specify your own file name.

Return to *terminal mode* by using the **Jump** key ([Alt]-[Scroll Lock]) from the File Transfer Primary Option Menu.

Every time you wish to save a screen, jump to *PC mode* and press [Enter]. This will cause the default option (Option 0) to be selected from the File Transfer Primary Option Menu. This option saves the screen.

If the file does not already exist, it will be created the first time you choose Option 0. Where it already exists, saved screens will be appended to it.

As long as the File Transfer Program remains loaded, you will be able to continue to save screens.

Saving the Screen to Disk

Notes:

SECTION III

PROBLEM SOLVING

Notes:

Chapter 7

Diagnosing Problems

Analyzing the Problem

If the system does not appear to be working as you expect, you might find problems in one of the following areas:

- o The connections
- o The PC
- o The host computer
- o The application software
- o The CXI 3278/79 STANDARD interface board
- o The Control Program

This chapter will help you isolate the problem. We suggest that you proceed through the following suggestions item by item.

The Checklist

1. First check the obvious hardware connections.

Are all hardware peripherals such as the monitor, keyboard, and disk drives properly connected? Don't skip by this suggestion--it is possible that a connection has worked loose, or that someone inadvertently disconnected some vital piece of hardware.

2. Determine whether the hardware is properly installed.

Check the following possibilities:

Is the modem operational? Are the modem LEDs flashing in a familiar pattern? Is the modem error LED flashing? The line may have been dropped or there may be a high line error rate.

If this is the first time you have used the remote connection, did you specify an existing PUID (i.e. is there a corresponding VTAM terminal list at the host)? Also, have you dialed in to an SNA port on the host communications controller?

Diagnosing Problems

Is the modem cable securely connected at both ends?

Is it possible that the cable has been damaged in some way? Try substituting another cable.

Is the CXI interface board installed in accordance with the instructions?

Are the jumpers on the CXI interface board set correctly?

Is the Control Program configured to match the jumper settings?

Checking Your Software Configuration

If the host system has been configured to expect IBM 3278/79 models different from the ones for which you have customized, you may experience problems--especially if you have defined a model with a smaller screen than the corresponding one in the host terminal list . As part of your problem analysis, you should check that your Control Program is configured correctly.

Appendix C tells you how to customize the Control Program. You may enter the command, **CXICFIG**, using your operational Control Program name as the operand. If you page through the customization screens, the default values will show you how you configured it. If you find any errors, you may change them and re-customize the Control Program in place.

Handling PC Hardware or Software Problems

If you suspect that the PC hardware or software is not functioning properly, you should run the diagnostic procedures suggested in the Problem Determination Procedures Section in Guide to Operations, IBM Manual 6025003. Follow the instructions given there for reporting or correcting the problem.

APPENDICES

Notes:

Appendix A

Technical Data

| | |
|---------------------|-----------------------------|
| Power Requirements | +5 V at 0.5A |
| Physical Dimensions | 10.2 x 12.7 cm (4" x 5") |

Environment

| | |
|-------------------|---|
| Temperature | |
| Operating | 0 ⁰ to 45 ⁰ C (32 ⁰ to 110 ⁰ F) |
| Storage | -30 ⁰ to 70 ⁰ C (-20 ⁰ to 160 ⁰ F) |
| Relative Humidity | 0% to 95% non-condensing |
| Heat Generation | 2.5 W (9 BTU/h) |

Interfaces

External

| | |
|---------------------|--|
| Physical/Electrical | EIA RS-232C (DB25-P Connector to Modem, DB9-P Conn- ector to next PC *) |
|---------------------|--|

| | |
|----------|------|
| Protocol | SDLC |
|----------|------|

| | |
|-----------|---------------------|
| Data Rate | Up to 9600 bit/s |
|-----------|---------------------|

| | |
|----------|---|
| Internal | Standard IBM PC Interface, via edge connector |
|----------|---|

* Requires CXI Daisy-Chain Kit

Technical Data

Notes:

Appendix B

Installing the Board

Contents

Modem Cable

Identifying the Items

How To Proceed

Tools

Preparing the Board

Preliminary Steps

Installing the Board in the System Unit

Daisy-Chaining

Installing the Board

Notes:

Appendix B

Installing the Board

This Appendix shows how to install the CXI board in an IBM Personal Computer. **Appendix C**, "Customizing the Software," describes how to install the Control Program.

Installation of the CXI 3278/79 STANDARD remote connection board involves the following steps:

1. Identifying the items
2. Locating the appropriate tools
3. Preparing the board
4. Removing the cover from your PC
5. Inserting the board
6. Replacing the cover on the PC

Items 4, 5 and 6 and, possibly, item 2 may not apply if you have an IBM-compatible personal computer. You should consult the manufacturer's instructions for opening, board insertion and closing.

Modem Cable

You will need to use the 3-meter modem cable, supplied with the product, to connect your PC to a synchronous modem. In the U.S. and Canada, the modem will, typically, be a 212 (1200 bit/s), 201 (2400 bit/s) or 208 A/B (4800 bit/s). The last two can be used over leased or dial-up lines; the 212 is dial-up only. In other countries, the modem will, typically, conform to CCITT Recommendation V.22 (1200 bit/s), or V.27 (2400 or 4800 bit/s). Support of leased or dial-up lines varies from country to country. In any case, the modem's characteristics must match those of the corresponding host-site modem. Contact your MIS department for advice.

Identifying the Items

The box in front of each item is provided to allow you to check off your progress.

How to Proceed

First, identify the following items in your CXI 3270 PC connection package:

- ☐ 1. This User Reference Guide
- ☐ 2. Limited Warranty Statement
- ☐ 3. Warranty Registration Card
- ☐ 4. CXI Board with unique serial number
- ☐ 5. 3-meter male/female modem cable

There are other items in the package, but we are not concerned with them here.

The CXI board is sturdy. However, you should not drop it or expose it to a dusty or dirty environment. Hold the board by the green edges and try not to handle or put pressure on the chips themselves or on the gold strips.

Tools

The right tools always make a job easier. Here we suggest both required and optional tools that will help you install the board correctly.

Required Tool

- ☐ 1. Medium-sized flat blade screwdriver

Optional Tools (easier to use)

- ☐ 2. 1/4" nutdriver for the case screws
- ☐ 3. 3/16" nutdriver for the board screws

Preparing the CXI Board

The CXI 3278/79 STANDARD remote connection board contains seven jumpers. Figure B-1 shows their positions (not to scale).

Jumpers 4, 5 and 7 are set, as shown, at the factory. Their alternative settings are reserved for future use. The settings shown in Figure B-1 should not be changed.

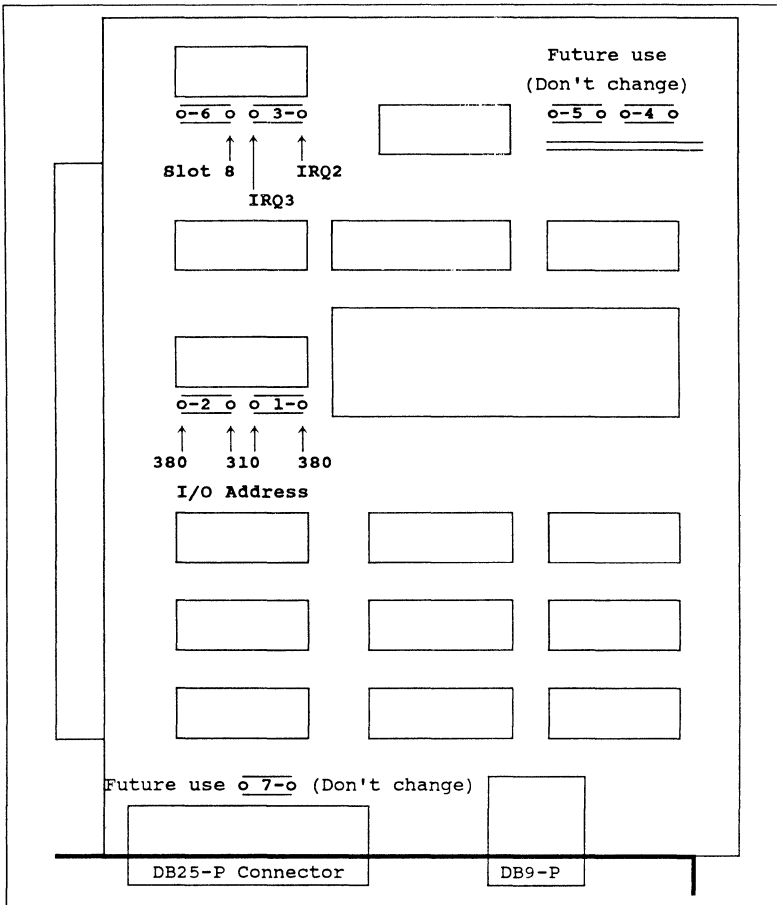


Figure B-1
CXI Modem Board with Jumper Settings

- ☐ 1. Set the IRQ (Interrupt Request) level. This is done with jumper 3. IRQ2 and IRQ3 are provided to allow you to select one which is not in conflict with other boards in your PC. The factory setting is IRQ2.

Note your setting for when you customize the Control Program (**Appendix C**).

Installing the Board

- ☐ 2. Set the I/O Port Address range. This is done with jumpers 1 and 2. Again, a choice is provided to avoid conflict with other boards in your PC. 310 selects 310 to 31F; 380 selects 380 to 38F. The factory setting is 380.

Note your setting for when you customize the Control Program (**Appendix C**).

- ☐ 3. Indicate whether you will be installing the board in slot 8 of a PC-XT (jumper 6). For any other slot or any other PC model, leave the factory setting as it is.

Preliminary Steps

Before you actually install the CXI board, you must also prepare your PC. Check off each step as you proceed.

- ☐ 4. **Turn off** the System Unit Power Switch.
- ☐ 5. **Turn off** any external option power switches for devices such as printers, hard disk drives, display monitor, etc.
- ☐ 6. **Unplug** the System Unit and all other optional devices from outlets.
- ☐ 7. **Disconnect** all power cables from the rear of the System Unit.
- ☐ 8. **Remove** all other units, such as the keyboard, the monitor and peripheral devices from your work area.

Installing the Board in the System Unit

- ☐ 9. Using either a flat blade screwdriver or 1/4" nutdriver, remove the cover mounting screws from the threaded tabs by turning them counterclockwise as shown in Figure B-2. (There will be two or five screws to remove, depending upon the model of PC.)

You do **not** need to remove all the screws--just those attaching the cover to the unit.

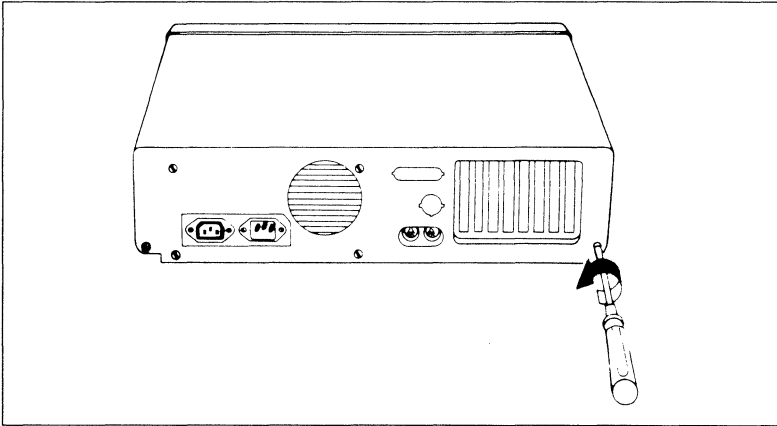


Figure B-2
Rear Panel of PC or PC-XT Unit

- ☐ 10. Pull the System Unit cover away from the rear.

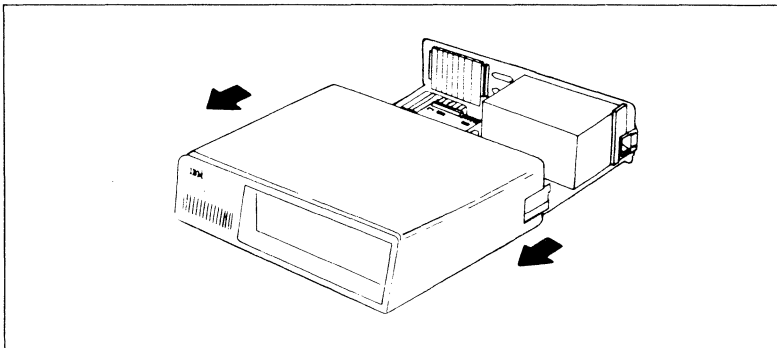


Figure B-3
Pulling the Cover Forward

- ☐ 11. When the cover will go no further, tilt it up and remove it from the base.

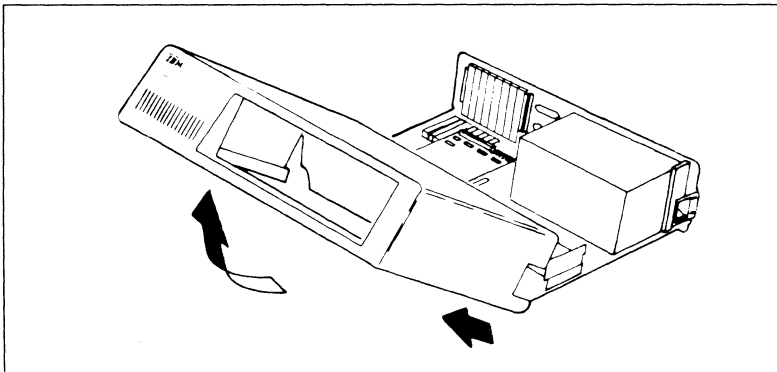


Figure B-4
Removing the Cover from the PC Unit

- ☐ 12. You will find the system expansion slots in the back of your PC System Unit. The number of slots depends on the model.
- ☐ 13. Using a flat blade screwdriver or 3/16" nut-driver, remove the screw that holds the system Expansion Slot Cover for the slot you have chosen. This cover keeps the dust out of the expansion slot until you put in a new board.

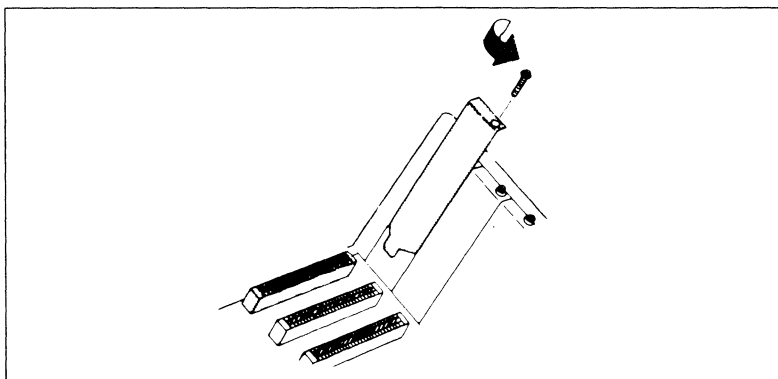


Figure B-5
Removing the Expansion Slot Cover

- ☐ 14. Hold the board by the top and press it firmly into the expansion slot you have chosen. (For a PC-AT, you may use either a one-connector or two-connector slot.)
- ☐ 15. Align the hole in the board retaining bracket with the hole in the rear panel of the System Unit, and tighten the screw by turning clockwise.

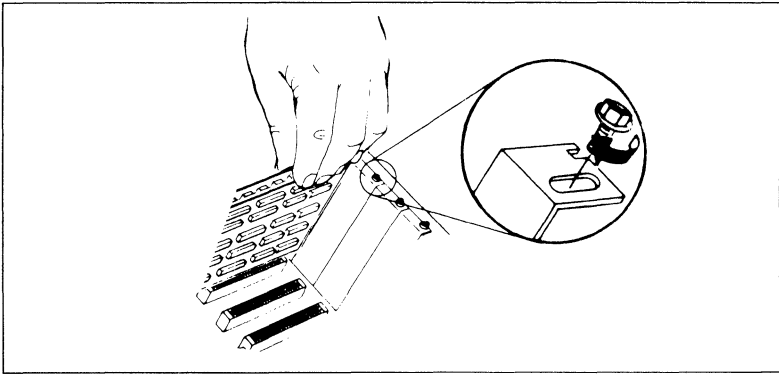


Figure B-6
Inserting, Aligning and Tightening the CXI Board

- ☐ 16. Replace the System Unit cover by carefully sliding it towards the rear of the unit.

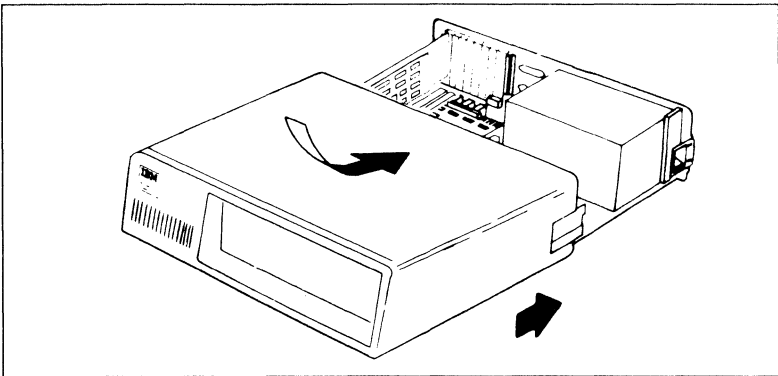


Figure B-7
Replacing the PC System Unit Cover

- ☐ 17. Align the cover mounting screws with the threaded tabs at the rear of the System Unit and tighten them by turning clockwise with a flat blade screwdriver.
- ☐ 18. Push the female connector of the modem cable into place and tighten the two securing screws.
- ☐ 19. Reattach the other cables and connectors which were removed previously.
- ☐ 20. You can now turn on the power and begin the installation and customization of the Control Program, as described in **Appendix C**.

Daisy-Chaining the Modem Board

The nine-pin connector on the board allows you to connect a number of PCs to the same modem, using an adapter cable supplied by CXI. (This connector is male, to prevent the inadvertent connection of your monitor to the board.)

A Daisy Chain Kit is available from your CXI distributor/dealer. It includes full instructions.

Daisy-chaining may not be used with a dial-up connection. As presently implemented, IBM's Systems Network Architecture (SNA) supports multiple devices on the same modem only for leased (non-dial-up) lines.

Appendix C

Customizing the Software

Contents

Introduction

How to Customize the Control Program

Host Terminal Control Table

Customizing the Software

Notes:

Appendix C

Customizing the Software

Introduction

Once you have installed the CXI 3278/79 STANDARD remote connection board, you are ready to customize the Control Program.

The customizat~~on~~ program will display a series of panels, each of which provides you with a number of options. As you select options, those that are mutually exclusive with the ones selected will be automatically deleted.

The customization program updates the Control Program in place, using the name you specify when you invoke it. You should copy the appropriate distributed version to your own file (with an extension of .EXE) before customizing.

The following are the distributed versions:

| | |
|---------------------|--|
| CXI3278A.EXE | SNA/SDLC Control Program, without LU Type 1 (3287 Printer) support |
| CXI3278B.EXE | SNA/SDLC Control Program, with LU Type 1 (3287 Printer) support |

How to Customize the Control Program

- ☐ 1. Bring up DOS (Version 2.0 or later).

If you have a hard-disk system, copy all of the distribution diskettes to an appropriately-named directory on the hard disk. Then go to Step 2.

If you do not have a hard disk, do the following:

- a. Format a double-sided diskette (DOS 2 format).

- b. Copy the contents of distribution Disk 2 (no host printer support) or Disk 3 (host printer support) to your diskette. If you wish to customize for other than a U.S. English keyboard, also copy the appropriate CXI????MAP and CXIB????XLT files from Disk 1 to this diskette. (For information on this topic, use the HELP command (HELP MAP and HELP XLT), on Disk 1.)
- ☐ 2. If you have a hard-disk system, enter the command:

CXICFIG CXI3278A

or

CXICFIG CXI3278B

If you do not have a hard disk, leave the diskette to which you copied the CXI diskette contents in the drive and set the prompt for the same drive (e.g. B:), then enter one of the above commands, e.g. **CXICFIG CXI3278A**.

If your PC has a Color/Graphics Adapter, you will be asked to say whether you have a color monitor (rather than composite monochrome), following which the following screen will be displayed.

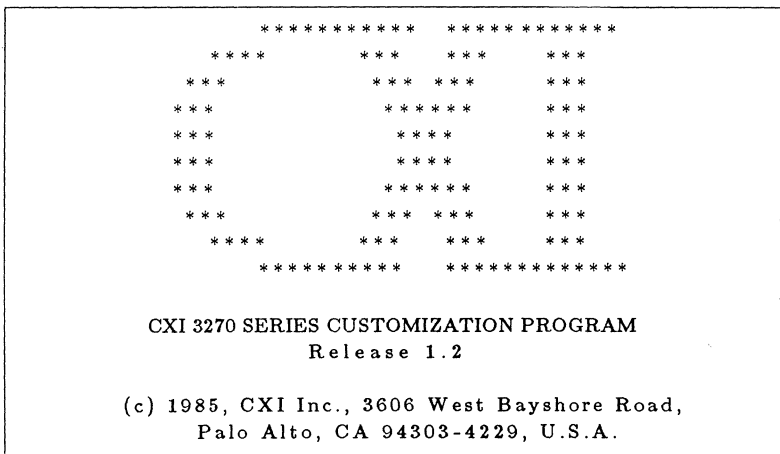


Figure C-1
Initial Panel

Under the copyright notice, there will be a message describing the version of the Control Program to be customized. If the description is as you expected, press Y. Otherwise press N to abort the customization process.

All panels except the initial one have the following legends, enclosed in a double border, at the bottom of the screen.

| |
|---|
| PgUp = Prev Panel ↑ = Prev Item ← = Prev Option Ctrl-C = Abort |
| PgDn = Next Panel ↓ = Next Item → = Next Option End = Customize |

Figure C-2
Legends for all Customization Panels

- ☐ 3. After you have pressed Y, the hardware customization panel will appear, as shown in figure C-3.

- | |
|---|
| 1. Specify Monitor Type |
| Monochrome Color |
| |
| 3. Specify SDLC Encoding Option for Interface Board |
| NRZ NRZI |
| |
| 4. Specify I/O Port Address for Interface Board |
| 310 380 |
| |
| 5. Is a Memory/PLUS Board Installed? |
| No Yes |

Figure C-3
Hardware Customization Panel

The default options will be displayed in reverse video (monochrome) or green (color).

On this and other panels, you can move from item to item by pressing the cursor up and down keys, and can select an option within an item by pressing the left and right cursor or Tab and Backtab keys. Each option is accepted as soon as it is selected, or excluded as soon as another option within the same item is selected.

For item 1, select monochrome or color, depending on the configuration of the PC on which the customized Control Program is to run.

For item 3, you must specify the encoding option for which the host-site communication controller port is configured. Check with your MIS department for this information. (NRZ [the default] is more common.)

For item 4, select the I/O port address for which you jumpered the board.

For item 5, if you have a CXI Memory/PLUS board in your PC, refer to your Memory/PLUS User Reference Guide. Otherwise, use the default of 'No'.

- ☐ 4. Press [PgDn]. The SDLC Control Unit Option Customization panel will appear, as shown in Figure C-4.

| |
|--|
| 2. Specify if SCS Format Override is Desired |
| No Yes |
| 4. Enter SDLC Control Unit Address: C1 |
| 5. Enter PUID for Switched Data Link Connection: 00000 |

Figure C-4
SDLC Control Unit Option Customization Panel

In the current release, response 2 defaults to Yes. It will be selectable in a future release. (You can select "No", but it will be ignored.)

For item 3 (default C1), enter the SDLC Control Unit Address. If you are daisy-chaining on a leased line (see **Appendix B**), you will probably use C1, C2, C3, etc. for the first, second, third, etc. units.

For item 4, you must enter the Physical Unit ID by which the host will recognize your device. This is sometimes referred to as the XID. Contact your MIS department for details.

- ☐ 5. *(This step is omitted if you are installing the Control Program without host printer support.)*

Press **[PgDn]**. The General Session Customization Panel will appear, as shown in Figure C-5.

| |
|--|
| 3. Specify Number of Host Sessions Desired |
| One Two |

Figure C-5
General Session Customization

You will normally select 'Two'. If you wish to use the display session only, you should customize the Control Program distributed as CXI3278A.EXE.

- ☐ 6. Press **[PgDn]**. The Host Display Session Customization Panel will appear, as shown in Figure C-6.

| |
|--|
| 3. Specify Session Screen Size |
| Model 2 (24x80) Model 3 (32x80) Model 4 (43x80) Model 5 (27x132) |
| 4. Enter Session Local Address: 02 |

Figure C-6
Host Display Session Customization

For item 3, select the screen size of the 3278/79 display you wish to emulate.

For Item 4, you will normally specify 02 (default) for the LU Type 2 (display) Host Session. If you wish to use a specific LOCADDR (as defined in the VTAM terminal list at the host), you may do so. (See the Host Terminal Control Table at the end of this Appendix.)

- ☐ 7. (This step is omitted if you are installing the Control Program without host printer support.)

Press **[PgDn]**. The Host Printer Session Customization panel shown in Figure C-7 will appear.

4. Enter Session Local Address: 03

Figure C-7 Host Printer Session Customization

This allows you to specify the printer local address (LOCADDR). You may respecify it as you would the host display session.

- ☐ 8. Press **[PgDn]**. The Control Program Option Customization panel will be displayed, as shown in Figure C-8.

1. Specify if Numeric Lock Feature is to be Enabled for Host Activity
No Yes
2. Specify if Numeric Keypad can be used outside PC Session
No Yes
3. Enter Interrupt Number for Application Program Interface: 111

Figure C-8
Control Program Option Customization Panel

Item 1 is not implemented in the current release.

Specify "Yes" for item 2 if you want to be able to use your PC's numeric keypad as a 10-key pad for host or notepad sessions.

Software provided by CXI (e.g the File Transfer Program) uses interrupt 111. If you will be using File Transfer, do not change the interrupt number. Do not choose interrupt numbers used by the BIOS or by DOS (0 to 95), or those used by the BASIC Interpreter (128 to 240). (The customization program does not check for these ranges, but does reject any number over 255.)

- ☐ 9. Press [**PgDn**]. The Character Translation Customization Panel will appear, as shown in Figure C-9.

| | | |
|---|-----------------|---------|
| 1. Specify Source of National/Keyboard Translation Tables | | |
| CXI | User | |
| 2. Specify Language for National/Keyboard Character Set | | |
| U.S. English | Austrian/German | Belgian |
| Canadian-French | Danish | Finnish |
| French | International | Italian |
| Japanese-English | Norwegian | Spanish |
| Swedish | U.K. English | |
| 3. Enter EBCDIC/Buffer Code Translation Table File Name: CXIBSTD1.XLT | | |
| 4. Enter Keyboard/Display Filename: CXISTD1.MAP | | |

Figure C-9
Character Translation Customization

If you choose the CXI option in item 1, items 3 and 4 will be deleted. If you choose the User option, item 2 will be deleted. For the coaxial connection, item 3 will be omitted.

In item 2, you should select the keyboard name which corresponds to the language which was selected from the Language Diskette when the controller to which your PC will be attached was customized. If you are in the U.S. or Canada, the normal choice will be U.S. English. (The language diskette is only used for other than the standard U.S. English 87-key EBCDIC typewriter keyboard.)

If you choose the User option in item 1, you will need to have present, in the same directory as the customization program, an appropriate keyboard/display file. The creation of this file is discussed in the CXI 3270 Series Technical Reference Manual (Section II and the Appendices). The appropriate EBCDIC/Buffer Code Translation Table file also needs to be present. HELP MAP and HELP XLT provide information on both these topics. (The HELP command is on Disk 1 of the distribution diskette set.)

- ☐ 10. *(This step is omitted if you are installing the Control Program without host printer support.)*

Press **[PgDn]** once more. The Printer Customization panel shown in Figure C-10 will appear.

| |
|--|
| 1. Enter LPT1 Escape Sequence for 6 Line/Inch: ↵2 8 Line/Inch: ↵0 |
| 2. Enter LPT2 Escape Sequence for 6 Line/Inch: ↵2 8 Line/Inch: ↵0 |
| 3. Enter LPT3 Escape Sequence for 6 Line/Inch: ↵2 8 Line/Inch: ↵0 |
| 4. Enter COM1 Escape Sequence for 6 Line/Inch: ↵2 8 Line/Inch: ↵0 |
| 5. Enter COM2 Escape Sequence for 6 Line/Inch: ↵2 8 Line/Inch: ↵0 |
| 6. Enter EBCDIC/ASCII Translation Table File Name: CXIPSTD1.XLT |

Figure C-10
Printer Customization

The optional printer session is not tied to a specific printer or COM port at customization time. Rather, the association is established during printer session initialization in Printer Control Mode (see Chapter 10). For this reason, you should enter information on this panel for all ports you might possibly use for the host-addressable printer.

If, for example, you have one printer with a parallel interface and are not sure whether you will use LPT1 or LPT2, you should specify its escape sequences for both ports.

You may enter control characters (e.g. [Ctrl][A], [Ctrl][B], etc.), the escape character ([Esc]) or any alphanumeric characters in the fields on this panel. The sequences which select 6 and 8 line/inch operation should be in your printer's reference manual. If you do not enter the correct control characters for your printer, the results will be unpredictable.

The EBCDIC/ASCII Translation Table (Item 6) is used to translate EBCDIC characters, from the host, to those ASCII characters which your printer can handle and which most closely correspond to the EBCDIC characters.

CXIPSTD1.XLT assumes the standard 96-character set used in the U.S., and is the only version provided with the current release. If you wish to create your own version, all you need to know is that the file consists of a single 256-byte record, and that the EBCDIC value is used as a displacement to the location, in the table, of the corresponding ASCII value. The name must be of the form, CXIPxxxx.XLT. The DOS DEBUG command is probably the best tool to convert the CXI-supplied file to one which matches your printer.

- ☐ 11. When you have selected all the options, press [End] to start the customization process. As you may want to review previous panels (using [PgUp]), you can initiate customization from any of them.

CXI3278A.EXE or CXI3278B.EXE will be updated in place.

A final message will be displayed, indicating the amount of memory, in kbytes, the Control Program will occupy. It does not include the memory occupied by DOS.

You may abort the customization process, at any time, by pressing [Ctrl][C].

Host Terminal Control Table

The Host Terminal Control Table for your remote connection might appear as follows:

```
LU1  LU  LOCADDR=2, DLOGMOD=T3278M2
LU2  LU  LOCADDR=3, DLOGMOD=T3287
```

The descriptors (e.g. T3278M2) used for displays and printers will vary from one installation to another.

You should ensure that your MIS department creates such a terminal control table and that they provide you with its associated PUID for entry in the SDLC Control Unit Option Customization panel.

Appendix D

Guide to Terminology

additional information area

The last 16 positions of the operator information area of the host display session. This area displays the line and column counters and, under program control, can display any 16-character message.

AID (Attention Identification) key

A key that produces an I/O interruption at the host computer. AID keys include the Enter key, the special function keys, and the programmed function (PF) keys.

ASCII

American Standard Code for Information Interchange. This defines 128 7-bit values which represent upper and lower-case alphabetic characters, numerals, special characters and control functions. On the IBM PC, this has been extended to 256 8-bit values, accommodating additional symbols and foreign characters.

base color mode support

A color display mode provided by IBM 3279 terminals. Two sets of field attributes (protected/unprotected, normal/intensified) are translated to four colors, as follows:

| | |
|--------------------|-------|
| Normal/Unprotected | Green |
| Bright/Unprotected | Red |
| Normal/Protected | Blue |
| Bright/Protected | White |

BSC

Binary Synchronous Communication. A communication method used to transmit data at high speed between two devices. BSC is one method used to transmit data between an IBM host computer and a 3274 or 3276 controller. For more detailed information, consult IBM reference manuals on binary synchronous communications. (CXI 3278/79 STANDARD remote connection does not support BSC operation.)

communication link

An electrical and logical connection between two devices. For a communication link to be 'up', the electrical connection (including telephone lines and modems) must be functioning properly, and the devices must be transmitting the proper characters to each other.

composite symbols

Groups of indicator symbols which, when appearing together, convey a distinct meaning. For example, the composite symbol '?+' means 'input character not accepted.'

controller

A device which communicates with the host computer and relays information between the host computer and up to 32 physical or 128 logical terminal devices.

customization

The process of tailoring a product to the requirements and preferences of the user.

default disk

The disk drive which was the current drive when the program was activated. Although the default disk is usually the one which last appeared in the PC-DOS prompt (e.g., A>), it can be changed by a program.

diagnostics

Programs or routines which test a processor or other equipment to determine whether it is operating properly.

EBCDIC

Extended Binary Coded Decimal Interchange Code. The coded character set used by IBM host computers.

emulation

The duplication of the functional capability of a device upon a different device.

File Transfer Program

An application program which uses the callable services of the Control Program to provide useful services, such as file transfer to and from an IBM host computer.

host computer

An IBM (or compatible) 'mainframe' computer which communicates with the CXI 3278/79 STANDARD remote connection-equipped PC over a communications line.

indicator symbols

A set of distinctive symbols which are displayed on the bottom line of the screen of an IBM 3278 or similar terminal to inform the user of the status of the terminal and its environment. These symbols are not present (for the most part) in the character set of the IBM PC, and so the closest equivalents are used.

I/O (Input/Output) port

A circuit which receives data from the main processor or provides data to the processor. There are 65,536 possible I/O port addresses on the IBM PC.

jumper

An electrical conductor which connects two points in a circuit together. On CXI boards, the jumpers are small metal clips which are used to complete a circuit between two metal posts and thereby select a configuration option.

Jump

A function which allows the user to alternate between *terminal mode* and *PC mode*.

menu

A display which lists the choices available to the user and allows selection of a choice by the entry of one or two characters.

motherboard

The main printed circuit board of a computer system, into which may be plugged smaller boards to expand the functions of the system. In the IBM PC, the motherboard is also called the "system board."

Operator Information Area

The bottom line of a 3278/79 display or of a 3270 PC display when the current window belongs to a host session. It contains symbols which show the status of the terminal and controller.

panel

A display which requests information from the user and provides entry fields into which to place the information.

resident program

A program which, once loaded into memory, remains there until the system is powered down or until it is reset using [Ctrl][Alt][Del]. The services of the resident module are instantly available to the user or to other programs.

screen buffer

A memory area within the Control Program module which contains the characters and attributes corresponding to those of a 3278/79 display.

screen print

The transferring of the contents of the current screen (physical or logical) to a printer attached to the IBM PC.

screen save

The transferring of the contents of a 3278/79 logical screen to a disk file.

scrolling

The process of moving the contents of a logical screen upwards, downwards or sideways on the physical PC display.

SNA/SDLC

Systems Network Architecture/Synchronous Data Link Control. A communication method used to transmit data at high speed between two devices. SNA/SDLC is one method used to transmit data from an IBM host computer to a 3274 or 3276 controller or to a device such as the CXI 3278/79 STANDARD remote connection. For more detailed information, consult IBM reference manuals on SNA/SDLC.

status line

(See Operator Information Area.)

TSO

Time Sharing Option. A widely used multi-user system on large IBM host computers.

typematic

A property of the keys on the IBM PC. With typematic action, holding a key down has the same effect as successive rapid key depressions.

VM/CMS

Virtual Machine/Conversational Monitor System. A widely-used multi-user system on IBM host computers.

CXI 3278/79 STANDARD remote connection

COMMENTS

We have provided this form to encourage you to provide CXI with timely feedback on your experience with the CXI 3278/79 STANDARD remote connection.

We would like both negative **and** positive feedback. So, please take a moment to use this form whenever you have an opinion to express or a problem to report. When we receive it, we will send you some replacement forms, so that the communication can continue.

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Comment ☐ Positive ☐ Negative

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Product(s) ☐ Control Program (CXI3278A)
☐ Control Program (CXI3278B)
☐ Customization Program (CXICFIG)
☐ Keyboard Map Utility (KBMAP)

☐ Other (Specify: _____)

Please use the other side for your comments and/or a description of the problem, if any.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Tel: (800) 221-6402 (in California, (415) 424-0700)

Thank you for your support of CXI and its products.

| |
|--|
| <p>CXI 3278/79 STANDARD REMOTE CONNECTION RELEASE 1.0</p> |
|--|

SYSTEM ATTACHMENT REQUIREMENTS

The **CXI 3278/79 STANDARD remote connection Control Program** supports connection, via synchronous modem, to an *SNA/SDLC* port on an *IBM 3705 or 3725 Controller* or compatible equivalent.

Both leased line and dial-up connections are supported.

Customization of *ACF/VTAM* on the host and *NCP* on the 3705 or 3725 are exactly as they are for an *SNA/SDLC 3274* with one *LU Type 2 (Display)* device and one optional *LU Type 1 (3287 Printer)* device. You will need to request this support from your MIS department.

Data encoding, which may be NRZ or NRZI, must match that of the corresponding 3705/3725 port.

MEMORY REQUIREMENTS (approximate)

| | kbytes |
|---|---------------------|
| Control Program | 219 |
| For Host-addressable Printer Support | 45 |
| For each Host Session | - Printer 0 |
| (maximum 1 display | - Model 2 7 |
| and 1 optional | - Model 3 9 |
| printer) | - Model 4 12 |
| | - Model 5 12 |
| For Color | 12 |

Example, for Typical System

Model 2 display session, with color monitor and no host printer support

$$219 + 7 + 12 = 238 \text{ kbytes}$$

Minimum System

Model 2 Host Session, monochrome monitor

$$226 \text{ kbytes}$$

Maximum System

Model 4 or 5 Host Session, Host-addressable
Printer Session, color

$$288 \text{ kbytes}$$

[Memory requirements do not include DOS (28-50 kbytes)]

CXI CONNECTWARE™

PCOX Series

Programmer's Guide and Technical Reference Manual

Abstract:

This manual contains the detailed programming information required to:

- Construct a Keyboard/Display file which alters the keyboard mapping provided with your PCOX product.
- Integrate program applications to communicate internally with the host through the PCOX Application Program Interface.
- Integrate application programs originally written to interface with IRMA™ using IRMASUBS.

The information includes:

- Instructions for using the CXI Keyboard Map Utility.
- Code tables required for reference when altering keyboard mapping.
- CXI Standard Keyboard/Display File Tables
- A detailed explanation of the use of translation tables by the CXI Control Program.
- Instructions for use of the CXI Application Program Interface (API).
- Programming specifications for each of the API function calls.
- Instructions for using the CXI Compatibility Application Program Interface (CAPI) to replace IRMASUBS.

To obtain copies of this manual, use the order form on the following page.

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